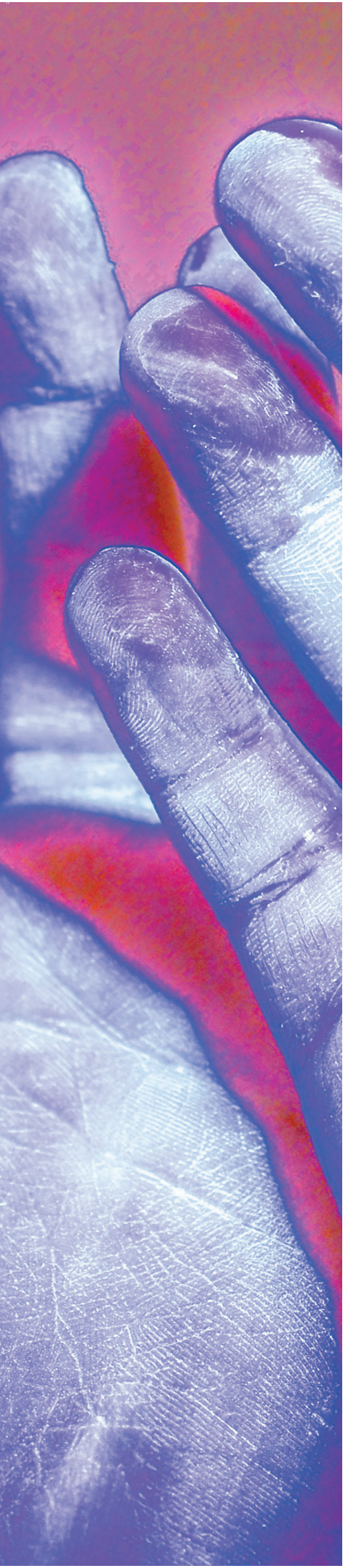
HOLCHEM

LEADERS IN HYGIENE TECHNOLOGY

In Safe Hands



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Introduction To Hand Hygiene

The aim of the 'In Safe Hands' Brochure is to assist management in the implementation and control of good hand hygiene practice. It provides background information on hand hygiene and practical guidance on its management in food processing or food service.

Following Semmelweis' observations on the effect of hand washing on the incidence of Puerperal Fever in a maternity ward in the 19th Century, good hand hygiene has been recognised as an important factor in controlling the spread of infectious disease (Greig et.al., 2007). Also, food poisoning organisms can be transmitted to food by dirty hands, causing illness to those eating it.

In the UK alone more than 23 million days are lost to employers each year through diarrhoea and vomiting. Globally, less than a fifth of people currently wash their hands properly at critical times. For the food producers and retailers who supply contaminated product which results in isolated or large-scale food poisoning outbreaks, the consequences can be disastrous. Penalties can vary from small fines to site closure.

In most food processing or food service environments the handling of food is commonplace and often impossible to avoid. Cross-contamination by the transfer of pathogenic or food spoilage organisms can be a significant issue. Hands are one of the most common vehicles for transfer of microorganisms to high-risk products and can become contaminated in a number of ways. Lack of hand washing when required and not following a correct hand washing procedure are the most common problems observed.

The primary reason for washing hands is to prevent cross contamination of pathogens to food products and food contact equipment, which in the food industry could lead to food poisoning incidents. Hand washing is also a prerequisite prior to donning gloves and following their removal. Additionally, the design of the hand washing facility should minimise contamination of the user and the washroom environment.

Legislation & BRC Requirements

Legislation relating to hand washing in food premises in the EU can be found in EU Regulation 852/2004 (Annex II) on the Hygiene of Foodstuffs and more specifically for animal derived products in EU Regulation 853/2004 (Annex III)

More detailed information on the application of hand washing to control human infections can be found in the FSA document Food Handlers Fitness to work

For food manufacturers supplying the major UK retailers, The British Retail Consortium Global Standard for Food Safety Version 8 provides requirements for hand washing facilities:

All hand soaps must comply with EU Regulation 1223/2009 on cosmetic products.

Key information from these documents is summarised below.

Annex II, General Hygiene Requirements for all Food Business Operators, Chapter 1 General Requirements for Food Premises, Paragraph 4

An adequate number of washbasins is to be available, suitably located and designated for cleaning hands. Washbasins for cleaning hands are to be provided with hot and cold running water, materials for cleaning hands and for hygienic drying. Where necessary, the facilities for washing food are to be separate from the hand-washing facility.

Annex II, General Hygiene Requirements for all Food Business Operators, Chapter VIII Personal Hygiene, Paragraph 1

Every person working in a food-handling area is to maintain a high degree of personal cleanliness and is to wear suitable, clean and, where necessary, protective clothing.

British Retail Consortium Global Standard for Food Safety Version 8.

Criteria Reference 4.8.4

Suitable and sufficient hand-washing facilities shall be provided at access to, and at other appropriate points within, production areas. Such hand-washing facilities shall provide at a minimum:

- Advisory signs to prompt hand-washing
- A sufficient quantity of water at a suitable temperature
- Water taps with hands-free operation
- Liquid/foam soap
- Single-use towels or suitably designed and located air driers.

7.2.2 Hand cleaning shall be performed on entry to the production areas and at a frequency that is appropriate to minimise the risk of product contamination.

Excellent guidance is given by the FSA in their guidance document "Food handlers fitness to work"

Intended audience:	All food business operators except primary producers (Primary producers can use it as best practice advice and Enforcement Officers will also find it useful.
Regional coverage:	UK
Legal Status:	This guidance is intended to: • Accompany legislation • Describe best practice
Purpose / Summary:	People who work around open food while suffering from certain infections (mainly from bacteria and viruses) can contaminate the food or surfaces the food may come into contact with. This can spread infection to other people through the food. This guidance helps managers and staff to prevent the spread of infection by advising which illnesses and symptoms staff should report and what managers should do in response. In summary: • Diarrhoea and / or vomiting are the main symptoms of illnesses that can be transmitted through food. • Staff handling food or working in a food handling area must report these symptoms to management immediately. • Managers must exclude staff with these symptoms from working with or around open food, normally for 48 hours from when symptoms stop naturally.

Resident & Transient Bacteria

Hands carry two main types of bacteria, resident and transient.

Resident bacteria are a part of our natural flora and are not normally pathogenic. The washing and disinfecting of hands will remove most of these bacteria present on the skin surface, suppressing the bacterial levels for a given period of time. However, the numbers will begin to increase shortly after the washing has been completed.

It is virtually impossible to remove all resident bacteria from the skin and tests have shown that after repeated washing large numbers of bacteria can still be recovered from the fingers and thumbs.

Resident bacteria are found on the superficial skin surface (epidermis). However, 10 to 20% of this total resident population are within the epidermal layer of the skin and in skin crevices where they are very difficult to remove or kill.

The type and number of resident bacteria vary from person to person and generally don't cause food poisoning. However, the exception is *Staphylococcus aureus*. It is estimated that 40% of people carry this microorganism in the nasal area and 3% on their hands as part of their resident body flora. Infected cuts and boils can be a significant source of *Staphylococcus aureus.*

Thorough hand washing can reduce the number of microorganisms but it is impossible to remove or kill all of them.

Transient bacteria are those that are found on the surface of the skin but do not normally reside there. They have been transferred onto the skin from another source either by direct contact or by aerosol. Transient bacteria can cause infection on broken skin.

Transient bacteria have been collected on the surface of the hands, usually on the palms, under fingernails and on the fingertips. Unless these bacteria can be removed effectively they are likely to be spread from hand to food contact surface, thereby presenting a cross contamination risk.

The type of transient bacteria on the skin will be varied and dependant on what has been touched. Pathogens such as *Escherichia coli O157,* Salmonella spp*, Shigella spp* and *Clostridium perfringens* can all be carried on the skin.

In addition, high levels of transient microorganisms are found attached to hand, finger tips and fingernails surfaces after visiting the toilet and after handling raw food. These may include a significant number of pathogens.

Broken skin, cuts, boils and spots cannot effectively be cleaned by a hand washing routine and should therefore always be properly covered with a waterproof plaster.

Barriers to Hand Washing

The majority of people can appreciate to some extent the importance of correct hand washing.

Some of the most common reasons for failing to wash hands correctly are:

- Insufficient management commitment and enforcement
- Failure to educate and motivate employees
- Inadequate facilities, soap or drying materials
- No effective system in place for hand washing
- Poor access to hand wash sinks
- Poor quality hand soap which can result in a weak lather or dry and cracked skin
- Water temperature too cold/hot making it unpleasant to wash hands
- Using a stiff nailbrush resulting in damaged skin or inflammation
- Not enough time allocated for hand washing
- Lack of notices/posters
- High staff turnover
- Not removing wrist and hand jewellery
- Not keeping nails clean and short and free from nail polish/gels

Religious objection to alcohol sanitisers can also be an issue, though the Muslim Council for Britain have declared that the use of alcohol for hand hygiene purposes is encouraged within the remit of infection control because (a) it is not an intoxicant and (b) the alcohol used in the gels is synthetic, i.e. not derived from fermented fruit (Smith, D., 2009).

Effective Hand Washing

The objective of the food handler when washing their hands should be to reduce the number of transient bacteria to a safe level. Effective hand washing relies on friction and dilution to achieve this.

A single wash procedure is required after the following situations:

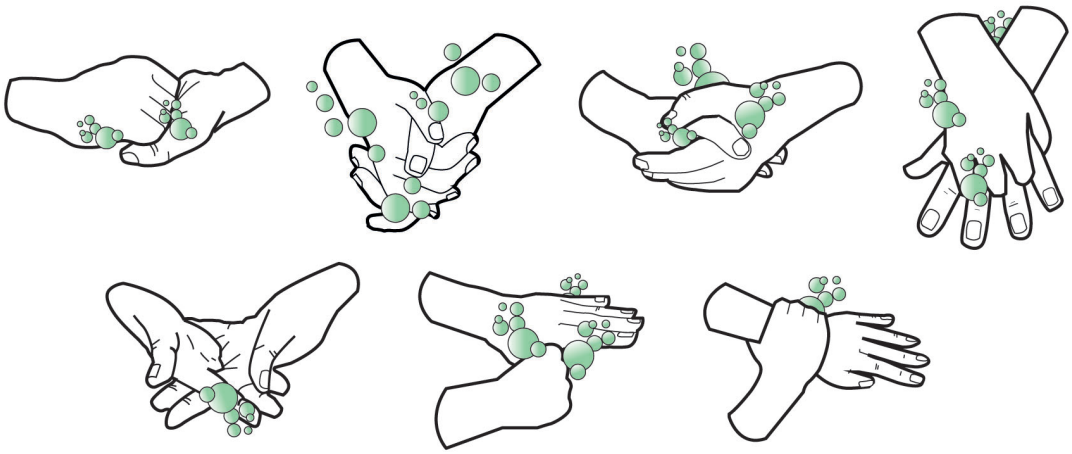
- Touching hair, nose, mouth or ears
- Smoking, coughing or blowing nose
- Handling waste
- Light cleaning tasks
- Handling external packaging
- Before and after putting gloves on
- Touching dirty surfaces (there may be instances where a double hand wash procedure is required)
- Handling money
- Before starting work
- Before handling food
- After removing contaminated clothing and before putting on clean protective clothing
- After every break
- After eating and drinking

After the following activities, which are likely to result in a large number of pathogens on the hands, a double wash procedure is recommended:

- Using toilet paper when there is a risk of faecal contamination
- After cleaning up human body fluids
- Changing or putting on a dressing or touching an infected cut, wound or boil
- After handling raw poultry, meat or vegetables prior to handling ready-to-eat food
- Heavy cleaning tasks

A guide on an effective hand washing technique can be used to ensure food handlers are trained as competent in effective hand washing.

- Wet your hands thoroughly and apply liquid soap.
- Rub palm to make a lather.
- Rub the palm of one hand along the back of the other hand and along the fingers. Then repeat with the other hand.
- Rub palm to palm with fingers interlaced.
- Rub the backs of the fingers with the opposite palm with the fingers interlocked. Then repeat with the other hand.
- Clasp and rotate the thumb in the palm of the opposite hand. Then repeat with the other hand.
- Rub backwards and forwards over the palm with clasped fingers. Then repeat with the other hand.
- Rinse off soap with clean water and dry your hands hygienically.
- Apply a hand sanitiser.



How does hand washing with soap work? Bacteria that can cause disease can become trapped in dirt, grease and in the natural oils on the hands. Water alone does not remove them, but adding soap helps to break down the bacteria carrying oils. Soaps also facilitate rubbing and friction to remove any bacteria present on the hands.

The hand washing and drying procedure should take approx. 45 seconds to complete, with experts recommending 20 seconds of scrubbing and rubbing with soap as the most effective duration for hand washing. This doesn't include the time required for the application of a hand sanitiser. This can be applied and rubbed into the hands whilst the person is making their way (where possible) to their point of work

Research has shown that scrubbing with a nailbrush can provide over 350 times greater removal of transient bacteria from the hands than washing without (Snyder, O.P.). Scrubbing underneath the fingernails was found to offer the most significant reduction.

If nail brushes are to be used in the hand washing procedure choose the type carefully. If the bristles are too firm regular washing may damage the skin; causing the skin around and under the fingernail to become inflamed or split.

Soft nailbrushes should ideally be used to help loosen the soil around and under the nail, should be kept clean and disinfected and should be changed frequently.

However, in most food manufacturing environments and in the health care sector, the use of nail brushes has significantly decreased over the years due to the difficulties in effectively managing them from a hygienic point of view. It is also viewed as being difficult to enforce their use on a regular basis due to the perception of users that the nail brushes damage the skin and increase the risk of dermatitis.

Commonly Missed Areas During Hand Washing

The blue areas on the illustrations show the areas commonly missed or poorly washed.

Hand Soaps

The use of soap and warm running water for hand washing remains an effective method for reducing the levels of hand borne microbiological contamination (Senior, et. al., 2014). The use of soap and cold running water has also been shown as effective for hand decontamination, though is likely to be practically less effective than soap and warm water. This is because staff will not leave their hands in cold water for as long as warm water.

Individuals will have different levels of resistance to hand care products; most will suffer no ill effect while others may suffer skin irritation or even dermatitis. As a food handler, regular hand washing is essential and needs to be encouraged so the soap must be pleasant to use.

Dermatitis is a common condition that can affect workers in many industries. The signs are redness, swelling, blistering, flaking and cracking of the skin. This dermatitis (or eczema) is caused by contact with certain chemicals. The skin acts as a barrier and if damaged will lose its ability to protect, leading to irritation. The irritation can be caused by direct damage to the skin or by sensitisation to a chemical. In the latter case this involves an immune system reaction.

Operatives working within a food production area may wash and sanitise their hands many times throughout the working day. All detergents contain surface-active agents (surfactants), which are designed to remove debris; regular and prolonged washing can remove some of the protein and fats in the protective layer of the skin surface. Hand soaps should be formulated to minimise damage to the skin; good quality hand soaps contain ingredients to remoisturise the skin and therefore help maintain its elasticity and its ability to act as a natural barrier.

Hand soaps are available in the form of a bar, liquid and foam. Bar soaps are difficult to manage in the food industry, could become a source of contamination and look very unprofessional. Generally liquid soaps are used from wall-mounted dispensers with some dispensers being refillable and other systems using replaceable sealed cartridges. Soaps can be a good growth medium for bacteria, although good quality hand soaps should have preservatives built into them to reduce the risk of bacterial growth. Refillable soap dispensers can easily become contaminated and subsequently grow high populations of bacteria if the hand soap dispenser is not routinely stripped down for cleaning. Modern refillable hand soap dispensers, such as those sold by Holchem, can be easily disassembled for effective cleaning and disinfection.

A replaceable sealed cartridge dispenser with integral pump mechanism ensures that the soap is dispensed free from contamination and also removes the potential of clumsy and messy refilling of containers.

Barrier creams (sometimes known as pre-work creams) claim to reduce the physical action of a specific substance on the skin. Barrier creams are not used prior to food production because of the risk of food contamination from the cream.

Remoisturisers (sometimes known as after work creams) help replace moisture and temporarily restore the barrier effect of the skin, thereby allowing the natural remoisturisation of the skin to take place. Remoisturisers should not be applied prior to direct food handling because of the risk of food contamination. It is recommended when leaving production areas that operatives wash their hands then use a remoisturiser to protect the skin surface.

Whilst hand washing will be an essential element of any hand hygiene programme, it is important to recognise that all hand washing will have an effect on the skin. If washed frequently the skin on the hands will be damaged, making it easier for transient organisms to colonise the skin, which may be more difficult to remove. If hands are washed more than 20 times per day, then most dermatologists would consider that this is a cause for concern.

ANTIMICROBIAL v NON-ANTIMICROBIAL SOAPS

Although antimicrobial soaps have a distinct advantage over non-antimicrobial versions in that they can achieve a higher bacterial log reduction during a standard hand washing procedure, several lab studies have found that the use of non-antimicrobial soaps can be nearly as effective. Rotter et al (1999) determined that washing the hands for 30 seconds with a non-antimicrobial soap can achieve up to a 2.8 Log reduction, close to the typical figure of 3 Log achieved when using an antimicrobial soap. Larson et al (2003) also found that there was no difference between the use of an antimicrobial and a non-antimicrobial soap in reducing the bacterial counts on the skin. There is some evidence that because antimicrobial soaps are more aggressive than non-antimicrobial soaps that, they can have a long term undesirable effect on resident bacteria (typically harmless). The defence provided by the resident bacteria may become weaker and thus allow transient bacteria an opportunity to colonise the skin. With respect to the food industry, if soaps are non-antimicrobial they can lead to the growth of food spoilage micro-organisms such as Pseudomonsa, which if not adequately rinsed off, could become a food spoilage issue to handled foods.

The most important part of any hand washing procedure is the technique employed and the time spent on it.

Hand Drying

This is the final stage of the hand washing process and is critical to achieving dry hands but can often be overlooked. It has been demonstrated that the dryer the hands after proper hand washing, the lower the level of cross contamination from hand to food or to food contact surface. One study found that 1,000 times as many microorganisms can be spread from damp hands than with dry hands (Patrick et.al., 1997).

The most effective drying method will continue to be debated. Warm air dryers, high velocity air dryers, disposable paper towels or cabinet towels may all be used but each has drawbacks. Warm air dryers are generally not recommended in food processing areas as the user is unlikely to achieve thorough drying of the hands, leaving the hands damp and promoting microbial growth. People may also become impatient and use their work garments to finish drying their hands.

Dyson and other manufacturers have introduced high velocity air hand dryers which have proven to be very popular and are making inroads into the food industry. These types of automatic hand dryers scrape the water off the surface of the skin by blowing air at speeds of up to 400 mph.

There may be some environmental benefits to using automatic hand dryers as they cut down the amount of waste generated and saves the time required emptying bins and disposing of it. However, high velocity dryers are noisy and can restrict the throughput of operatives through the drying stage of the hand wash process.

Paper towels can be dispensed in a variety of ways to provide a fast throughput of operatives undertaking a hand drying action. There is obviously a benefit if the dispense does not involve touching the dispenser parts as buttons or levers to dispense the towel are a cross contamination point. Units that avoid hand contact either by directly pulling on the towel or by automatic means have a distinct advantage. However, if not disposed of properly, used paper towels are a potential foreign body issue in food stuffs and storage of paper towels also needs careful consideration since they are extremely absorbent. Ideally, they should be kept in a dry area where the risk of becoming damp is negligible.

Automatic Hand Dryers V Paper Towel

In a study by the Food Hygiene Department at Campden BRI the use of paper towels was compared against warm air dryers (Taylor et. al., 2000). The study showed that there was no significant difference between the two approaches with respect to the amount of bacteria recovered from the hands after washing and drying had finished. In a more recent study, (Margas et. al., 2013) showed that there was no significant difference in the spread of contamination from the hand drying process using high velocity air dryers or paper towels to the changing room environment. The selection of hand drying methods is thus not dependent on the hygiene aspects of hand drying, but rather the practical aspects related to the movement of operatives through the changing room, costs and sustainability etc.

Hand Sanitisers

Hand sanitisers can quickly reduce the number of microbes on hands in some situations, but may not be effective when hands are visibly dirty or greasy. Hand sanitisers have traditionally been based on alcohol, although some newer generation products are alcohol free. The solution is rubbed into the hands after thorough washing and drying and allowed to evaporate on the hands. The hand sanitiser, which may be an alcohol only or in combination with a biocide, provides a further reduction in microorganisms on the skin surface. Alcohol based hand sanitisers often contain an emollient system that helps reduce the drying of the skin caused by the alcohol.

Alcohol preparations based on either gels or liquid hand rubs can offer a significant reduction in microbiological hand contamination, which studies claiming 3.5 log reductions under specified conditions that are greater than hand washing approaches (Smith, D, 2009). However, there are important limitations to how alcohol rubs and gels should be used, and these may introduce uncertainties regarding their efficacy.

Where hands are not visibly contaminated with organic matter, but there is a concern about transfer of potentially pathogenic bacteria via the surface of the hands, then an alcohol sanitiser should be considered. These are quick acting, effective and if correctly buffered do not cause skin damage.

Little published data exists on the performance of hand hygiene methods in the context of variable to heavy organic loading.

In the health care sector, where prevention of infection is an important issue, the emphasis is now more on limiting hand washing to where it is really necessary and using alcohol sanitising rubs as an alternative.

Independent Testing of Hand Soaps & Sanitisers

When selecting a hand soap or hand sanitiser, consideration should be given to the antimicrobial efficacy of each product, especially the sanitiser. In Europe, the most common methods for testing hand soaps and hand sanitisers are EN1499 (hygienic hand wash) and EN 1500 (hygienic hand rub).

- EN1499 - In this protocol, the number of organisms released from the fingertips of hands artificially contaminated with *E. coli* is measured before and after washing with the test product. This gives a reduction factor. This is compared to the reduction factor achieved using a standard soft soap. If the test product is demonstrated to be statistically better than the soft soap, (greater reduction) and passes a test such as EN 1276 standard for biocidal activity then EN1499 can be claimed.
- EN1500 - This protocol compares a test hygienic hand rub to 60% propan-2-ol. To claim EN1500 the mean reduction of test organisms achieved by the test product should not be significantly smaller than achieved by the reference propan-2-ol product: additionally the test product must pass a test such as EN 1276 standard for biocidal activity.

Gloves

Gloves may be used to protect the product from hand contamination, or to protect the hands from the product.

It needs to be considered that disposable gloves can become a source of contamination and it is important to consider if gloves can be used safely. Hands should always be washed thoroughly before gloves are put on; any damaged gloves should be disposed of; change gloves at least every break; wash hands after wearing gloves to remove any bacteria that may have collected in the perspiration under the gloves and gloves should be changed if they come in contact with anything else apart from the ready to eat foods that are being handled.

Gloves that are used in the food industry must be of suitable design and material. These are made from either latex, rubber and non-latex materials such as vinyl or nitrile and can provide added protection. Some arguments against using gloves are that they can limit dexterity, cause skin irritations and can contaminate foods if not managed effectively. Some are in favour of gloves being used as they can protect hands from chemicals, protect food from direct contact and can be used to cover bandages and plasters.

Gloves may be seen as a method of stopping resident bacteria contaminating the food. Studies have shown that if individuals didn't wash their hands correctly before putting on the gloves, microorganisms from the hands could adhere to the internal and external surfaces of the glove (Adams et. al. 1992). Training in the correct procedure for donning and removal of gloves is essential as it is very likely that anything that is on the glove may contaminate the hands if gloves are removed incorrectly.

Wearing of occlusive gloves is equivalent to wet work due to the hyperhydration that will occur. This can lead to skin damage, ultimately resulting in irritant contact dermatitis. Furthermore, the hyperhydrated skin is more easily penetrated by both chemicals and microorganisms. It should also be considered that the skin remains hyperhydrated for some considerable time after gloves have been removed and is thus vulnerable from contact with contaminated surfaces.

The integrity of the glove is essential. Tests carried out on gloves from five different manufacturers produced the following results:

- Vinyl gloves: - 4% had defects, 34% allowed the penetration of bacteria, and 53% failed in use (Korniewicz et. al. 2004).
- Latex gloves: - 2.7% had defects, 20% allowed the penetration of bacteria, and 3% failed in use (Korniewicz et. al. 2004).

When specifying gloves, it is important to understand the standard that is required. Gloves are graded using a system called AQL (Acceptable Quality Level), as shown in the table below:

Level	AQL	Faults per 100 gloves
1	4.0	<4.0
2	1.5	<1.5
3	0.65	<0.65

The development of a glove policy is an essential component of the management of personal hygiene in a food manufacturing environment.

Managing Hand Hygiene

Management of Hand Hygiene

Most food poisoning outbreaks are caused by negligence or ignorance and a failure to implement good hygiene practice. That is why food processors should ensure that they have various management systems in place to ensure that standards are met.

Hand washing must be practised consistently to work, so that people will be in the habit of automatically washing their hands at all times. This requires staff to have the necessary tools to wash their hands (soap and water) and that they are reminded or persuaded to do so on an on going basis.

A knowledgeable and motivated workforce that understands their responsibilities is the key to good food production. The following elements need to be in place to ensure the system is effective.

Policy

Each food processor should have a Hygiene Policy in position covering all aspects of their provisions for hygiene management. Amongst the provisions of the policy should be a section on personal hygiene and hand care.

From this policy the site can set the requirements for standards, facilities, training, implementation and monitoring. The policy should also make provisions for contractors, visitors and customers.

Setting The Standards

To determine the standards of hand washing required in a food premises a hazard analysis must be conducted first. This should take into account where hand wash facilities are required, when hands need to be washed, what cross contamination routes there may be, training, monitoring etc.

Whilst conducting a hazard analysis it should be remembered that a good hand wash followed by a thorough drying procedure will typically realise a 3 log reduction with a further 1 log reduction achievable by the introduction of an alcohol based hand sanitiser.

On completion of the hazard analysis, standards can be set for hand hygiene, usually in the format of microbiological limits. These should primarily be set on Total Viable Count (TVC) but could include *Enterobacteriaceae* and specific pathogens such as *Staphylococcus aureus* or *Listeria*. Again, it should always be remembered, however, that the hand hygiene procedure has a defined efficacy in terms of log reduction, the variation of TVC counts on clean hands can be high and can exceed the log reduction capability of the hand hygiene procedure on some individuals, and that operative's may have high starting levels of bacteria (including pathogens) if they have been handling raw materials.

Facilities

The quality and quantity of the hand care facilities provided by a food processor will determine the effectiveness of a site's hand care policy. The planning and attention to locations of hand care facilities must be given careful consideration so as not to impede on existing operations. Ideally hand care facilities should be provided at entrances and exits to production areas, toilets and any other locations established from the planning phase.

Once the locations for hand care facilities have been determined the following should be provided:

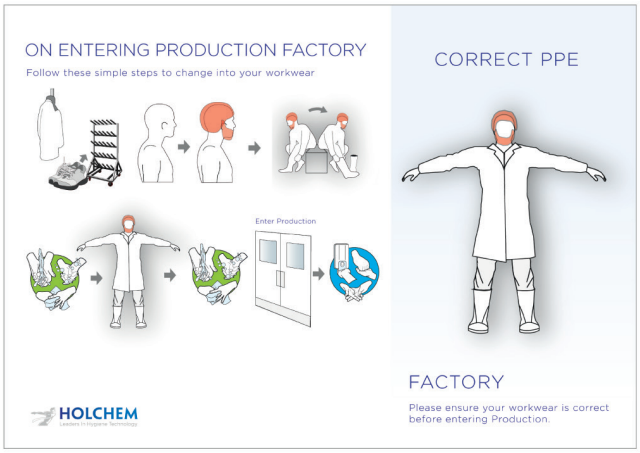
- Sufficient hand wash sinks
- The hand wash sinks to be fed with a good volume of warm water (approx. 34-38˚C @ 4-8 litres min)
- Operation of the water should be via a knee operated valve or automatic sensor valve
- Hand wash sinks should be equipped with hand soap dispensers and a suitable drying method
- Waste bins for used paper towels, preferably foot operated (if paper towels are used)
- Hand sanitiser dispensers particularly in high care environments
- Time allowed for all operatives to follow the correct procedure
- Posters displayed to show correct hand-wash procedure
- Regular refilling of hand soap, disinfectant and towel dispensers.

Hand washing facilities must be included within the premises cleaning schedule system and cleaned on at least a shift basis, preferably before and after shift changeovers. Contaminated hand wash facilities may reduce the effectiveness of the hand wash procedure. Particular attention should be paid to those surfaces that are routinely handled by operatives. The site must also ensure that there is a clear distinction between hand wash sinks and those sinks used for utensil cleaning or for cleaning food.

Changing Procedures

The changing procedures employed throughout food premises can vary from site to site. Depending on the nature of the product that is produced, layout of the area or historical reasons.

A sequence of steps has been proposed by Margas and Holah (2014) to maximise the control of pathogens on the hands (residents and transients collected on the hands prior to entering the working environment), at the earliest opportunity during the changing procedure.



- Remove outer clothing, such as coats, and place into a locker or hang on rack
- Remove shoes and place into a locker or another suitable means of storage
- Put on clean, disposable hair covering (mob cap or hair net or both) and additional headgear (helmet, hat, etc.) if required
- Cross barrier
- Put on factory footwear
- Wash and dry hands
- Put on coat
- Wash and dry hands, (a second handwash after donning PPE is usually a retailer requirement and is justified technically if factory footwear or any other PPE might be contaminated).
- Enter production area
- Apply post wash hand sanitiser to hands

If gloves are to be used then these too may require sanitising with the hand sanitiser. It is always good practice to have pictorial signage displaying the procedure to be employed for changing before entering a food processing area.

Training

Whilst most people recognise that hand washing is important, people do not know intrinsically how to wash their hands effectively. All personnel who enter the food processing area (food operatives, contractors, visitors etc.) should therefore receive an appropriate level of training.

The training and education of food handlers is one of the most important factors affecting the success of achieving the standards required. Compliance with a method or procedure will increase if there is understanding and agreement on that requirement.

Ideally, training should consider the following.

- Reading and understanding of the Personal Hygiene Policy
- The need to take personal responsibility for hand hygiene procedures
- Demonstration of an appropriate, validated hand hygiene procedure, followed by observation of an individual's compliance with the procedure.
- Visualisation of soiling level on the body and its reduction by good hand hygiene practices. This can be undertaken rapidly by the use of Adenosine Triphosphate (ATP) swabs before and after hand washing or more visually by placing hands on general microbial growth agar in large Petri dishes, again pre and post hand washing, and allowing microbial colonies to develop over 24-48 hours.
- Indication of areas of the hands frequently missed by hand washing. A difficult to see gel is placed onto operative's hands, rubbed into the skin and then individuals are asked to wash their hands. Residual gel on the hands can then be viewed by placing hands under a UV light to highlight any areas 'missed'. Hands contaminated with the dye can also be used to touch other objects and the UV lamp then used to show the transfer of contamination from the hands to the touched objects.
- Evidence that wet hands translocate more microorganisms than dry hands - this usually takes the format of pressing the hands onto an agar plate, then wetting the hands and pressing them onto a second plate and observing any subsequent differences in microbial growth between 'dry' and 'wet' plates.
- Requirements for PPE and how it should be donned and removed.

Assessment of hand care training should establish that the trainee understands and can demonstrate competency, including:

- The need for hand washing
- When to wash their hands
- How to wash and dry their hands
- How to disrobe and don factory PPE

Information on the hand washing procedure should be displayed at each hand wash station in the form of posters or signage.

Implementation

For any system to be effective it is vital that the responsibilities for overseeing it are clearly defined. Management play a crucial role and without input and commitment the system will surely fail. It is therefore important that management not only set and communicate policy on hand care but must lead by example as well by ensuring they follow the correct hand wash procedure at all times. Management personnel should also enforce the policy throughout the site's operations ensuring that the standards for hand care are met and maintained.

Good hand hygiene procedures, particularly when handling RTE foods, is critical to food safety. There should be a disciplinary procedure in place for consistent non-compliance by food handlers on all matters relating to hygiene. This will act as an additional deterrent in the drive to ensure that the site's Hygiene Policy is adhered to.

Monitoring

Once the training has been completed the management team will need to monitor compliance to the hand hygiene procedure. This may be carried out in a number of ways and it may be necessary to carry out more than one method of monitoring.

The constant monitoring of hand care should receive the support from management that it deserves. It can be done in a couple of ways:

- Observation of individual washing procedure
- Closed circuit television

CCTV and visual checks are an effective method of monitoring the hand washing procedure and will identify personnel skipping or incorrectly washing their hands. However, these methods cannot determine if the hands are free of bacteria.

Monitoring should also make provisions for the quality of facilities provided such as hand soap, hand disinfectant, paper towels, cleaning and disinfection of facilities and the quality and temperature of water.

Verification

Recording the usage of hand washing/drying/sanitisation consumables is a very simple and effective method of determining if hand washing compliance is occurring. If the usage levels of these items aren't consistent over a period of time, it may indicate that hand washing frequency is declining and retraining shall be undertaken.

Verification of effective hand washing is usually undertaken by hand swabs. Whilst the interpretation of hand swab data can be difficult (has a microbiological standard been achieved?), the action of taking the swabs on food operative's cleaned hands is a very positive reinforcement of the need for good hand hygiene, as compared to the unobtrusive recording of soap and water usage. All results of monitoring and verification should be recorded, along with any actions that are recommended and those that are implemented.

Review

The entire hand care system should be reviewed on an ongoing basis but no less than once per year. The review should include the policy, facilities, training, implementation and monitoring.

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Products and Systems

Dispensers With Refill Cartridges

Luxor Hand Soap Dispenser

Foam dispenser for cartridge product H4 Foam Soap (Luxor). The dispenser delivers 0.7 ml per push.

1 off Order Code: **OPTE21/Luxor**

Foamsan Hand Sanitiser Dispenser

Foam dispenser for cartridge product H6 Hand Sanitiser (Foamsan). The dispenser delivers 0.7 ml per push

1 off Order Code: **OPTE21/Foamsan**

Luxury Hand Soap Dispenser

Foam dispenser for cartridge product H3 Hand Soap (Luxury). The dispenser delivers 0.7 ml per push.

1 off Order Code: **OPTE21/Luxury**

Luxor

A high quality, antimicrobial foam soap with skin conditioning ingredients.Luxor has been tested and passes EN12054 and EN1499.

3 x 1.25 litre Order Code: **OPTH4/Box**

Foamsan

An antimicrobial, foaming, non drying post wash hand sanitiser gel. The antimicrobial efficacy of Foamsan has been tested and passes EN12054 and EN1500.

3 x 1.2 litre Order Code: **OPTH6/Box**

Luxury

A pleasantly fragranced luxury hand soap. Not suitable for use in food production areas.

3 x 1.25 litre Order Code: **OPTH3/Box**

Luxcell Dispenser

Liquid dispenser for cartridge product H5 Hand Soap (Luxcell). This dispenser delivers 1.7 ml per push.

1 off Order Code: **OPTE20/Luxcell**

Luxcell

A high quality, gentle soap coupled with skin conditioning ingredients to ensure that no drying or adverse skin conditions occur

8 x 1 litre Order Code: **OPTH5/Box**

Luxsan Dispenser

Liquid dispenser for cartridge product H2 Hand Sanitiser (Luxsan). The dispenser delivers 1.7 ml per push.

1 off Order Code: **OPTE20/Luxsan**

Luxsan

An antimicrobial, non drying post wash hand sanitiser gel. The antimicrobial efficacy of Luxsan has been tested and passes EN12054 and EN1500.

8 x 1 litre Order Code: **OPTH2/Box**

Refillable Dispensers

Hand Soap Dispenser

Durable, hygienic refillable liquid dispenser for Hand Soap. The dispenser holds 0.9 litre and delivers 2 ml per push.

1 off Order Code: **OPTE115**

Handsan Dispenser

Durable, hygienic refillable foam dispenser for Handsan. The dispenser holds 0.9 litre and delivers 0.6 ml per push.

1 off Order Code: **OPTE117**

Hand Care Dispenser

Durable, hygienic refillable liquid dispenser for Hand Care. The dispenser holds 0.9 litre and delivers 1 ml per push.

1 off Order Code: **OPTE119**

Hand Soap

Hand soap is a liquid hand soap combining the cleansing power of synthetic soaps with an emollient that reduces the drying of the skin. It is unperfumed to avoid the tainting of food and is suitable for use in food processing or preparation areas.

4 x 5 litre Order Code: **HLM27/Box**

Handsan

A non-alcohol based antimicrobial, non drying, post hand wash hand sanitiser liquid. The antimicrobial efficacy of Handsan has been tested and passes EN12054 and EN1500.

4 x 5 litre Order Code: **HLH9**

Hand Care – Remoisturiser

Hand Care is a high quality moisturising lotion for hand use. It helps to re-moisturise the hands. This is of benefit when constant hand washing and cold weather can cause drying and cracking of the skin.

4 x 5 litre Order Code: **HLH29/Box**

Hand Mousse Dispenser

Durable, hygienic refillable foam dispenser for Hand Mousse. The dispenser holds 0.9 litre and delivers 0.6 ml per push

1 off Order Code: **OPTE118**

Hand Mousse

M8 Hand Mousse is a foaming hand soap, combining cleansing power with an emollient system and an antimicrobial agent. It is un-perfumed and maintains the skins natural moisture levels and elasticity.

The antimicrobial efficacy of Hand Mousse has been tested and passes EN12054 and EN1499.

1 off Order Code: **HLM28/4x5**

Dermolsan Dispenser

Durable, hygienic refillable liquid dispenser for Dermolsan. The dispenser holds 0.9 litre and delivers 2 ml per push.

1 off Order Code: **OPTE120**

Dermolsan

A QAC free, non drying, post hand wash hand sanitiser liquid. The antimicrobial efficacy of Dermolsan has been tested and passes EN12054 and EN1500.

4 x 5 litre Order Code: **HLD21/2x5**

Paper Products Dispensers and Refill

North Shore Hands Free Hand Towel Dispenser

BLACK	WHITE
TCR 57031	TCR 57032

- Robustly constructed dispense system
- Controlled usage dispenser delivering pre-measured towel
- Stub roll transfer eliminates waste
- High capacity dispenser reduces stock out
- Can save up to 30% in usage cost compared to centre feed and pulled products
- Available in 2 colour options

Hands Free Roll

1 Ply, 553 Sheets, Blue, 48 gsm.
Roll: 200 mm x 155 m,
12 Rolls per case
Order Code: **TCR50010/BL-12**

North Shore Wave 'N Dry Hand Towel Dispenser

BLACK	WHITE
TCR 57033	TCR 57034

- Totally touch free dispensing
- Towel is fully protected
- Simple to operate by passing hand underneath the Infra-red sensor
- Measured, adjustable dispensing reduces paper consumption and cost
- User has timed contact with the machine
- Stub roll transfer eliminates waste
- Clever compact 2 roll dispenser
- Releases one roll as the other is finished
- Reloading is quick and easy
- Cost effective system

Wave 'N Dry Roll

1 Ply, 553 Sheets, Blue, 40 gsm.
Roll: 200 mm x 155 m, 12 Rolls per case
Order Code: **TCR50008/BL-12**

Universal Hand Towel Dispenser

- Robust Dispensing Unit
- Simple to operate
- Flat Sheet Dispense System, controls cost in use
- Easy to load dispenser
- Low cost system solution

Order code: **TCR57027**

Universal Hand Towel - Blue

1 Ply, 660 Sheets, Blue, 40 gsm,
200 mm x 200 m, 6 Rolls per Case

Order code: **TCR50022/6**

Centre Feed Roll Dispenser

- Smooth, moulded plastic dispenser
- Self locking cover
- Holds Centre Feed Hand Towel

Order Code: **TCR57000**

Centre Feed Hand Towel

1 Ply, 750 Sheets, Blue, 20 gsm
190 mm x 300 m. 6 Rolls per Case

Order Code: **TCR50000/BL-1-6**

2 Ply, 395 Sheets, Blue, 35 gsm
200 mm x 150 m. 6 Rolls per Case

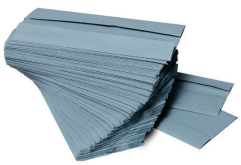
Order Code: **TCR50000/BL-6**

Paper Towel Dispenser

- Smooth, moulded plastic dispenser
- Holds C-Fold and Interfold Paper Towels

Order Code: **TCR57001**

C-Fold Towel



1 Ply, 184 Sheets, Blue,
40 gsm
217 mm x 310 mm
16 Sleeves per Pack
(2,880 sheets)

Order Code: **TCR50001/BL-2880**

Interfold Towels

1 Ply, 240 Sheets
Blue, 45 gsm
240 mm x 220 mm
15 Sleeves per Pack
(3,600 sheets)

Order Code: **TCR50009/BL-3600**

One Pull Dispenser

- Wipes are kept dry
- Allows controlled wipe dispense
- Transparent panel shows when to refill
- Side hinge for easy loads

Order Code: **TCR57030**

One Pull Hand Towel

1 Ply - 750 Sheets, Blue, 26 gsm
90mm x 300m, 6 Rolls per Case

Order Code: **TCR50000/1PLY-BL-6**

2 Ply - 395 Sheets, Blue, 35 gsm, 200 mm x 150 m 6 Rolls per Case

Order Code: **TCR50000/2PLY-BL-6**

Dispenser Mounting Boards

Hand Wash Station Boards for use in conjunction with all Holchem hand hygiene dispensers (dispenser not included)

For Hand Soap

1 off Order Code: **SKS20155**

For Hand Sanitiser

1 off Order Code: **SKS20156**

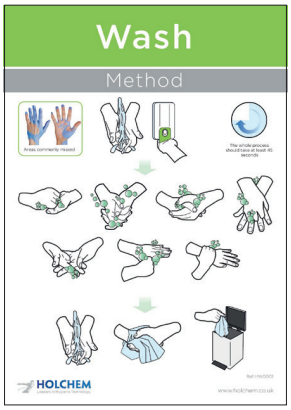
For Hand Re-Moisturiser

1 off Order Code: **SKS20157**

Hand Wash Posters

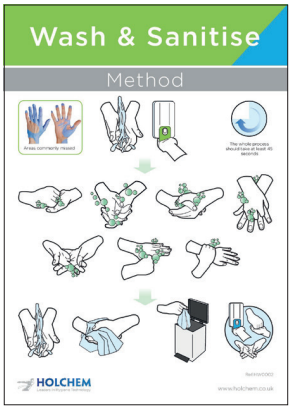
Hand Washing technique posters are self-adhesive, laminated signs for display in hand washing areas. They show the correct sequence and method of washing and drying.

Wash - Dry with Paper Towel



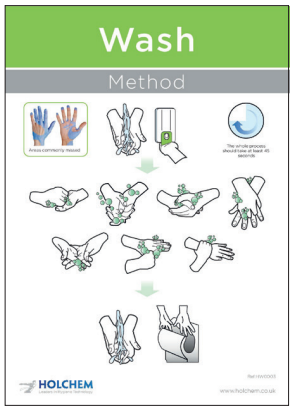
1 off Order Code: **HW0001**

Wash - Sanitise Dry with Paper Towel



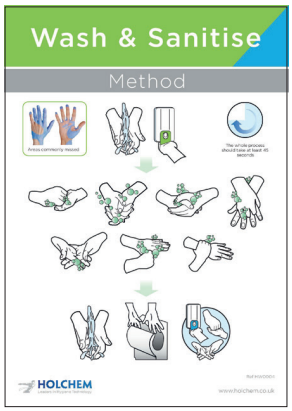
1 off Order Code: **HW0002**

Wash - Dry with Dyson



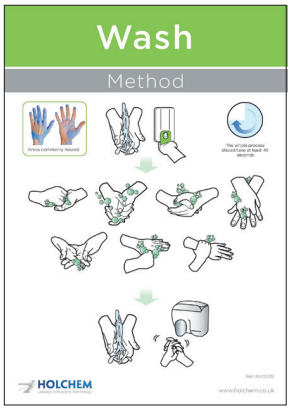
1 off Order Code: **HW0003**

Wash - Sanitise Dry with Dyson



1 off Order Code: **HW0004**

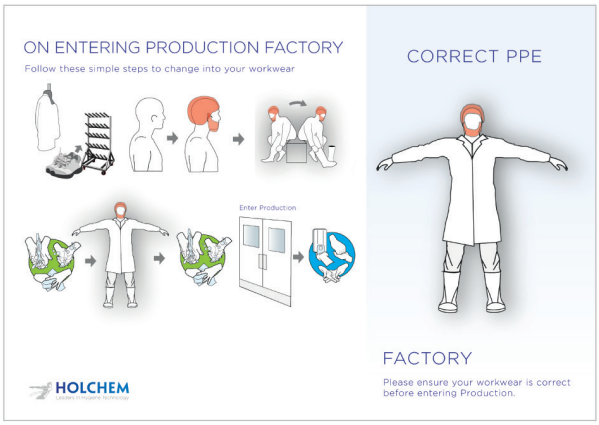
Wash - Dry with Hand Dryer



1 off Order Code: **HW0005**

Changing Procedure Signage

Below is an example procedure that Holchem can produce for its customers. The sequence of change can be illustrated to match the customer's changing procedure.



Changing Procedure Sign 1 off Order Code: **bespoke**

In Safe Hands DVD

The In Safe Hands training pack is designed to assist the implementation of good hand hygiene practice.

DVD Summary - In Safe Hands

Video	DVD Format. Running Time 5 minutes.
Scope	Why we need to wash hands
	When to wash hands
	How to wash hands
Target Audience	All staff, visitors and contractors who enter food processing areas.
Training	Suggest that video is part of personal hygiene training for induction or for more comprehensive training sessions.
Introduction to video	Explain scope of video.
	Ask the question why do we need to wash our hands.
After video	Reinforce message by asking:
	Why do we need to wash hands?
	When do we wash hands?
	How do we wash hands?

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